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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,638	12/17/2001	Sang-Soon Kim	678-723 (P9785)	4273

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EXAMINER

DANIEL JR, WILLIE J

ART UNIT	PAPER NUMBER
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2686

DATE MAILED: 12/19/2003

2

Please find below and/or attached an Office communication concerning this application or proceeding.

TS

Office Action Summary

Application No.

10/023,638

Applicant(s)

KIM ET AL.

Examiner

Willie J. Daniel, Jr.

Art Unit

2686

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/17/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Lim (US 6,628,974)** in view of **Lee (US 6,163,682)**.

Regarding **Claim 1**, Lim discloses an apparatus for controlling opening and closing of a folder in a foldable mobile communication terminal (see Fig. 5 “ref. 1”) having a main body (3) and a sub-body (2) foldably mounted on the main body (3), said sub-body (2) being opened or closed either automatically or manually in compliance with a user's selection, said apparatus comprising (see abstract; col. 5, lines 14-25; col. 7, lines 61-64; col. 8, lines 55-57; col. 9, lines 29-31; col. 11, lines 57-61; Fig. 5):

a sensor means (50, 51, 52) arranged at one end of the main-body (3) and the sub-body (2), for detecting a fully open status or a fully closed status of the sub-body (2) on the main-body (3) (see col. 6, line 56 - col. 7, line 9);

a sub-body (2) opening and closing drive unit (11) for automatically opening or closing the sub-body (2) by means of activating a sub-body drive motor (12) rotatably coupled with said one end of the sub-body (2), under control of a switch (5) which hereinafter reads on the “control unit” (see col. 5, lines 5-24), where a control unit would be inherent to respond to

Art Unit: 2686

the switch (5) operating the power transferring section and driving section. Lim fails to disclose having a current sensing unit and taking the measurement of the current. However, the examiner maintains that having a current sensing unit and taking the measurement of the current was well known in the art, as taught by Lee.

In the same field of endeavor, Lee teaches of a current sensing unit (14) coupled to the control unit (2) for sensing an amount of motor drive current applied to the sub-body drive motor and providing the sensed amount of motor drive current to the control unit (2) (see col. 4, line 65 - col. 5, line 42; Fig. 1), where the amount of current is detected when the motor is extracting/retracting or opening/closing; and said control unit for taking a measurement of the amount of the motor drive current output from said current sensing unit upon enabling of an automatic opening or closing operation of the sub-body in the sub-body opening and closing drive unit in compliance with the user's selection of automatic sub-body control, and for discontinuing to drive the sub-body drive motor when the measured amount of the motor drive current is larger than a predetermined current threshold value and the sensor means senses either one of a fully open status or a fully closed status of the sub-body (see col. 4, line 65 - col. 5, line 42; col. 6, line 7 - col. 7, line 22; Figs. 1, 2, 3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Lim and Lee to have an apparatus for controlling opening and closing of a folder in a foldable mobile communication terminal having a main body and a sub-body foldably mounted on the main body, said sub-body being opened or closed either automatically or manually in compliance with a user's selection, said apparatus comprising: a sensor means arranged at one end of the main-body and the sub-

body, for detecting a fully open status or a fully closed status of the sub-body on the main-body; a sub-body opening and closing drive unit for automatically opening or closing the sub-body by means of activating a sub-body drive motor rotatably coupled with said one end of the sub-body, under control of a control unit; a current sensing unit coupled to the control unit for sensing an amount of motor drive current applied to the sub-body drive motor and providing the sensed amount of motor drive current to the control unit; and said control unit for taking a measurement of the amount of the motor drive current output from said current sensing unit upon enabling of an automatic opening or closing operation of the sub-body in the sub-body opening and closing drive unit in compliance with the user's selection of automatic sub-body control, and for discontinuing to drive the sub-body drive motor when the measured amount of the motor drive current is larger than a predetermined current threshold value and the sensor means senses either one of a fully open status or a fully closed status of the sub-body.

The advantage of combining the teachings of Lim and Lee is to prevent the control device from being electrically and/or mechanically damaged (as suggested by Lee, col. 3, lines 10-13).

Regarding **Claim 3**, Lim teaches of a method for controlling automatic opening and closing of a folder in a foldable mobile communication terminal (1) having a main body (3), a sub-body (2) foldably mounted on the main body (3), a sensor (50, 51, 52) means for detecting a fully open status or a fully closed status of the sub-body with respect to the main-body (3), and a sub-body (2) opening and closing drive unit for automatically opening or closing the sub-body by activating a sub-body drive motor (14), under control of a control

unit (5) (see abstract; col. 5, lines 14-25; col. 6, line 56 - col. 7, line 9; col. 7, lines 61-64; col. 11, lines 57-61; Fig. 5), the method comprising the step of using a switch (5) to control the activation of automatically opening or closing sub-body (2) (see col. 5, lines 5-24; col. 8, lines 55-57; col. 9, lines 29-31) and discontinuing to drive sub-body (2) when the sensor means detects either a fully open status or fully closed status of the sub-body (2) (see col. 8, line 55 - col. 9, line 62). Lim fails to disclose taking a measurement during automatic open/close and discontinuing the drive of the motor when current is greater than a predetermined current threshold value. However, the examiner maintains that taking a measurement during automatic open/close and discontinuing the drive of the motor when current is greater than a predetermined current threshold value was well known in the art, as taught by Lee.

Lee further teaches of taking a measurement of the amount of motor driving current during extracting/retracting or opening/closing (see col. 4, line 65 - col. 5, line 42; Fig. 1) and discontinuing the drive of the motor is greater than a predetermined current threshold (see col. 4, line 65 - col. 5, line 42; col. 6, line 7 - col. 7, line 22; Figs. 1, 2, 3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Lim and Lee to have a method for controlling automatic opening and closing of a folder in a foldable mobile communication terminal having a main body, a sub-body foldably mounted on the main body, a sensor means for detecting a fully open status or a fully closed status of the sub-body with respect to the main-body, and a sub-body opening and closing drive unit for automatically opening or closing the sub-body by activating a sub-body drive motor, under control of a control unit,

Art Unit: 2686

the method comprising the steps of; taking a measurement of an amount of motor driving current applied to the sub-body drive motor when there is an activation of the sub-body opening and closing drive unit to drive the sub-body drive motor for opening or closing the sub-body in compliance with a user's selection to automatic opening or closing by a switch; and discontinuing to drive the sub-body drive motor when the measured amount of motor driving current is greater than a predetermined current threshold value and the sensor means detects either a fully open status or a fully closed status of the sub-body.

The advantage of combining the teachings of Lim and Lee is to prevent the control device from being electrically and/or mechanically damaged (as suggested by Lee, col. 3, lines 10-13).

Regarding **Claim 4**, the combination of Lim and Lee disclose everything claimed, as applied above (see claim 3), in addition Lee further teaches of a method wherein the measurement of the amount of motor driving current is carried out in a period of several tens of milliseconds (see col. 5, lines 49-67; col. 6, lines 44-55; Fig. 3), where the current is measured over a time period of milliseconds to eliminate over-current to motor and to avoid excess battery loss while extracting/retracting or opening/closing.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Lim (US 6,628,974)** and **Lee (US 6,163,682)** as applied to claim 1 above, and further in view of **Toba (US 6,438,392)**.

Regarding **Claim 2**, Lim teaches of having mobile communication terminal (1) having a first magnet disposed in a hinge (10) rotatably connected to one end of the sub-body

(2) and the main-body (3) (see col. 5, lines 4-19; col. 7, lines 4-9; Figs. 5, 6, 7, 12), where the magnet is the magnetic field generated for the magnetic sensor to respond to for determining the position of the folding component; an opening sensor (51, 52) disposed, in the vicinity of the hinge, on one end of a lower surface of a printed circuit board inside the main-body, for providing the control unit with a first sensing signal indicating a fully open status of the sub-body from the main-body, when the first magnet is placed in close proximity to the opening sensor (see col. 5, lines 4-19; col. 6, line 60 - col. 7, line 57; Figs. 5, 6, 7, 12), where the position detection section provides a controlling signal for the driving section. Also, contact switches can be used for determining the position of the foldable section. Lim fails to disclose having a magnet on an inner surface of the sub-body and a sensor mounted in a position to the magnet. However, the examiner maintains that having a magnet on an inner surface of the sub-body and a sensor mounted in a position to the magnet was well known in the art, as taught by Lee and Toba.

Lee further teaches of having a magnet (214) embedded in the flip cover (206) of a wireless telephone that is coupled to a switch or sensor (216) (see col. 5, lines 10-22; Fig. 15), where the sensor (switch) and magnet provides a signal for determining the state of opening/closing or retracting/extracting operation.

In the same field of endeavor, Toba teaches of having the magnet (7) and an opened/closed detection switch or sensor (5) (see col. 4, lines 38-53; Figs. 1, 3), where the sensor determines whether the folding portion is opened or closed as commonly done by a hall element or reed switch.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Lim, Lee, and Toba to have an apparatus wherein said sensor means further comprises: a first magnet disposed in a hinge rotatably connected to one end of the sub-body and the main-body, said hinge being provided with the sub-body opening and closing drive unit; a second magnet mounted inwardly on an inner surface of the sub-body, spaced apart from the hinge; an opening sensor disposed, in the vicinity of the hinge, on one end of a lower surface of a printed circuit board inside the main-body, for providing the control unit with a first sensing signal indicating a fully open status of the sub-body from the main-body, when the first magnet is placed in close proximity to the opening sensor; and a closing sensor disposed in a position opposing to the second magnet, spaced apart from the hinge, on the printed circuit board inside the main-body, for providing the control unit with a second sensing signal indicating a fully closed status of the sub-body onto the main-body, when the second magnet is placed in close proximity to the closing sensor.

The advantage of combining the teachings of Lim, Lee, and Toba is to have in a cellular telephone a way of the detecting open/close position of the foldable portion.

Conclusion

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. **Wilcox et al. (US 5,649,309)** discloses *Wireless Communication Device Having an Axially Aligned cover Release Mechanism*.
- b. **Martensson (US 5,151,946)** discloses *Variable Configuration Portable Telephone*.
- c. **Matsumoto et al. (US 4,857,813)** discloses *Self-Stopping Motor Control Circuit*.
- d. **Toki (US 6,373,006)** discloses *Opening and Closing Angle Detecting Apparatus and Foldable Device*.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Willie J. Daniel, Jr. whose telephone number is (703) 305-8636. The examiner can normally be reached on 7:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on (703) 305-4379. The fax phone number for the organization where this application or proceeding is assigned is (703) 746-3180.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-5424.

WJD,JR/wjd,jr
15 December 2003

Marsha D Banks-Harold
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